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EXAMINER

BURD, KEVIN MICHAEL

ART UNIT

PAPER NUMBER

2611

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                      |  |
|------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/523,167 | <b>Applicant(s)</b><br>BORRAN ET AL. |  |
|                              | <b>Examiner</b><br>Kevin M. Burd     | <b>Art Unit</b><br>2611              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                        |                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                            | 6) <input type="checkbox"/> Other: _____                          |

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 17-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the scope of enablement requirement. A single means claim, i.e., where a means recitation does not appear in combination with another recited element of means, is subject to an undue breadth rejection under 35 U.S.C. 112, first paragraph. *In re Hyatt*, 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (A single means claim which covered every conceivable means for achieving the stated purpose was held nonenabling for the scope of the claim because the specification disclosed at most only those means known to the inventor.). When claims depend on a recited property, a fact situation comparable to *Hyatt* is possible, where the claim covers every conceivable structure (means) for achieving the stated property (result) while the specification discloses at most only those known to the inventor.

2. Claims 24 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. No components of the apparatus are described in

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the system. Instead only the intended use of the communication system is recited.

Since no components of the communication system are recited in the claim, the claim is indefinite.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1-14, 22 and 23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Regarding claims 1-12, the recited method is not tied to another statutory class, such as a particular apparatus nor transforms underlying subject matter to a different state or thing. Instead the claims recite making an assumption or using information from an input and using statistics to generate a signal constellation. For this reason, the claims are rejected non-statutory.

Regarding claims 13 and 14, the claims recite a computer program per se. A computer program is not one of the four statutory classes.

Regarding claims 22 and 23, the claims recite an apparatus comprising means for language. When the limitations of the specification are read into the claims to understand what the means for comprise, it is determined the recited apparatus is not in fact an apparatus. Paragraphs 0024 and 0025 discloses the detector module 108 as an algorithm for assuming an imperfect knowledge of a fading channel state information (paragraph 0024) and using statistics of channel fading to encode additional information

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into the space-time matrix signal constellation as variations in amplitude of constellation points (paragraph 0025). Since the detector module 108 is an algorithm, claims 23 and 24 are non-statutory since an algorithm is not one of the four statutory classes.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 3-8, 10, 11, 13 and 15-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Fette et al (US 6,560,445).

Regarding claims 1, 11, 13 and 22, Fette discloses a method of establishing a space-time constellation. The signal to noise ratio (SNR) of each coefficient is used to determine the constellation that will be used for transmission (column 8, lines 20-51). An imperfect knowledge of the channel is assumed. Though the SNR is computed and used to determine the constellation, it can not be assumed this calculation of SNR is perfect and there are no flaws in the precision of this calculation.

Regarding claim 3, column 8, lines 52-67 discloses examples of the constellations according to the SNR values. Figures 13-16 show those constellations.

Regarding claims 4-7 and 10, Fette discloses the method of figure 17. The steps are repeated for each SNR for the communication link environment. The result is a table or set of tables that permit automatic optimization of the communication link under varying conditions (column 9, lines 41-48). The receivers are found in transceivers 1001 and 1003 of figure 18.

Regarding claim 8, the transceivers shown in figure 18 have one transmit antenna.

Regarding claims 15-17, Fette discloses an electronic storage medium (a memory) that stores constellation data. Fette discloses the transceivers 1001 and 1003 in the communication system of figure 18 will respond to conditions and select a constellation. The selected constellation will be provided to the transmitter and used for the transmission (abstract). The data that is stored in a memory is not a component of an apparatus. That is, by storing data on a memory, the memory is not patentably distinct from any other memory.

Regarding claims 18-21, Fette discloses the communication system shown in figure 18. The transceivers comprise transmitter and receiver components and can be either a base station, mobile station or both.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 9, 12, 14 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fette et al (US 6,560,445) in view of Dabak et al "Signal Constellations for Non-Gaussian Communication problems" Statistical Signal and Array Processing. Minneapolis, April 27-30 1993. Proceedings of the International Conference on Acoustics, Speech, and signal Processing (ICASSP), New York, IEEE, US, VOL. 4, pages 33-36.

Regarding claims 2, 9, 12, 14 and 23, Fette discloses the method stated above. Fette does not disclose the constellations determine the distance between the constellation points as a function of a Kullback-Leiber distance. However, Dabak discloses a method of computing optimum signal sets (abstract). By optimizing the constellation points for non-Gaussian communication problems, the problems can be overcome and proper communication between users be achieved. This optimization is achieved since the Kullback information can be used to express how performance varies with noise amplitude distribution and with signal set choice (III). Additional information regarding the Kullback information is provided in heading II. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Dabak into the method of Fette for the reasons stated above.

Regarding claims 24 and 25, the recited claims do not disclose any structural components of the claimed communication system and merely state the system uses a signal constellation. Fette discloses using a signal constellation to transmit information to a receiver. The receiver will demodulate the received signal (abstract and figure 18).

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The constellation is designed according the channel conditions (SNR) of the system (column 8, lines 20-51). Fette does not disclose the constellations determine the distance between the constellation points as a function of a Kullback-Leiber distance. However, Dabak discloses a method of computing optimum signal sets (abstract). By optimizing the constellation points for non-Gaussian communication problems, the problems can be overcome and proper communication between users be achieved. This optimization is achieved since the Kullback information can be used to express how performance varies with noise amplitude distribution and with signal set choice (III). Additional information regarding the Kullback information is provided in heading II. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Dabak into the method of Fette for the reasons stated above.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.



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Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 1, 2, 7, 9-25 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 41, 42, 45, 49, 50 and 57-58 of copending Application No. 10/671,346. Although the conflicting claims are not identical, they are not patentably distinct from each other because 10/671,346 discloses a method of establishing a constellation by determining a characteristic of a channel (claim 41). The characteristic is the SNR (claim 42). The selected constellation is that utilized for the transmission and the input bit stream is encoded in an amplitude of the symbols (claim 41). The reference discloses more detail than the instant claims. However, the more specific "anticipates" the broader (see *In re Goodman* – 29 USPQ2d 2010).

Claims 1, 2, 7, 9, 11 and 12 correspond to claim 41 of the reference.

Claims 13 and 14 correspond to claim 57 of the reference.

Claims 15-25 correspond to claim 49 of the reference.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin M. Burd/  
Primary Examiner, Art Unit 2611  
2/19/2009